

DEBRIS FLOWS/ AVALANCHES: PROCESS, RECOGNITION, AND MITIGATION

**Edited by John E. Costa and
Gerald F. Wieczorek**

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Edited by
JOHN E. COSTA
AND
GERALD F. WIECZOREK



The Geological Society of America
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Preface

Debris flows and debris avalanches are among the most dangerous and destructive natural hazards that affect humans and human works. Worldwide, these mass movements claim hundreds of lives and millions of dollars in property losses every year. The past two decades have been a time of great scientific and engineering advances in the understanding of the processes, the recognition of debris flow and debris avalanche potential, and the finding of ways to mitigate loss of life and property.

Recognizing the timely need to pull together some of the recent research results, the Engineering Geology Division and the Quaternary Geology and Geomorphology Division of the Geological Society of America co-sponsored a symposium on debris flows and debris avalanches at the annual meeting in Reno, Nevada, on November 5, 1984. Twenty papers were presented during that symposium. One of the "papers" was the premier showing of the U.S. Geological Survey's videotape entitled "Debris-flow dynamics" (U.S. Geological Survey Open-File Report 84-606). Of the remaining 19 papers, 14 are presented in this volume. Three additional papers have been added to balance topical coverage, making a total of 17 papers.

The 17 papers are arranged into three categories:

Part 1, Process, includes 9 papers which describe or interpret mechanisms initiating or operating during a debris flow or debris avalanche.

Part 2, Recognition, includes 6 papers which discuss different ways of dating and identifying potential debris flow and debris avalanche hazard areas.

Part 3, Mitigation, contains 2 papers which describe the state-of-the-art in debris flow hazard controls and flow characteristics prediction.

These 17 papers present a fair representation of where debris flow and debris avalanche work is being conducted in North America and by whom. Seven papers cover field areas in California, three papers are devoted to the Appalachians, three to British Columbia, one to Mount St. Helens, and one to Japan. First authors of these papers represent a remarkably even balance between government agencies (8), academic institutions (5), and private industry (4).

The cooperative spirit between the two GSA Divisions which led to the organization of the symposium in Reno has been sustained in this more permanent record of the symposium, and we are happy that the Engineering Geology Division agreed to publish it as a part of their series "Reviews in Engineering Geology."

We would like to thank several people who made the symposium, as well as the production of this volume, an enjoyable and worthwhile experience. Robert L. Schuster and Donald F. Eschman, former chairmen respectively of the Engineering Geology Division and the Quaternary Geology and Geomorphology Division, provided constant guidance and support, and Jeffrey R. Keaton and Garnett P. Williams supplied support and encouragement.

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